THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte MILIVOJ K. BRUN, KRISHAN L. LUTHRA and RAJ N. SINGH

_____

Appeal No. 1995-4981
Application No. 08/248,583[1]

_____

ON BRIEF

_____

Before WINTERS, METZ and PAK, ***Administrative Patent Judges***.

PAK, ***Administrative Patent Judge***.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 10 through 16, which are all of the claims pending in

[1] Application for patent filed May 24, 1994. According to the appellants, this application is a continuation of Application No. 08/057,919, filed May 7, 1993, now abandoned, which is a continuation of Application No. 07/716,444, filed June 17, 1991, now abandoned.

the application. This appeal is related to Appeal No. 96-2829, an appeal from the final rejection of claims 10 through 12 in Application 08/403,356, which is directed to a fiber reinforced silicon carbide matrix.

Claim 10, the broadest claim in this application, reads as follows:

10. A method for forming a fiber reinforced composite, the fibers being at least one of elemental carbon, or silcon carbide, in a matrix of silicon carbide containing at least a silicon carbide phase and elemental silicon phase formed by molten silicon infiltration comprising: depositing a continuous metal nitride coating on the fibers wherein the metal is selected from the group consisting of silicon, aluminum, titanium, zirconium, hafnium, niobium, or tantalum, the metal nitride coating preventing reaction between the reinforcement fiber and molten silicon;

admixing a carbonaceous material with the coated fibers so that at least 5 volume percent of the mixture is the coated fibers;

forming the mixture into a preform having an open porosity ranging from about 25 volume percent to about 90 volume percent of the preform;

heating the preform in an inert atmosphere or partial vacuum; and

infiltrating the heated preform with molten silicon to form the silicon carbide matrix composite.

As evidence of obviousness, the examiner relies on the following prior art:

Borom et al. (Borom)	5,015,540	May 14, 1991 (filed Jun. 1, 1987)
Rousseau	5,051,300	Sep. 24, 1991 (filed Aug. 15,1989)

Claims 10 through 16 stand rejected under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Borom and Rousseau.

We reverse.

The examiner states (Answer, page 4) that:

> In a method for forming carbon fiber composite articles which may be used in aircraft construction, Borom coats carbon on silicon fibers with silicon wettable materials (see col. 4, forth full paragraph), admixes the coated fibers with a carbonaceous material (see col. 5, first full paragraph), forms the mixture into a preform having 25-90 vol% porosity (see first and second full paragraphs of col. 6), heats the preform in an inert atmosphere of CO or CO_2 and infiltrates it with molten silicon (see second and third full paragraphs of col. 7). As taught in the first and second full paragraphs of col. 9, the matrix formed by Borom contains a silicon carbide phase and an elemental silicon phase.
>
> Also, please note Borom's teaching that an outer coating of carbon may be provided on the coated fibers as part of the carbonaceous material (see col. 5, lines 18-27).
>
> Borom differs from the instantly claimed invention only in that he uses boron nitride as the first coating material instead of a nitride of

> silicon, aluminum, titanium, zirconium, hafnium, niobium, or tantalum.

To remedy this deficiency of Borom, the examiner relies on Rousseau to demonstrate that it would have been obvious to one of ordinary skill in the art to substitute a nitride of aluminum, hafnium or zirconium for boron nitride in the method described in Borom. See the Answer, pages 4 and 5.

Appellants do not dispute the examiner's findings regarding the content of Borom. See the Brief in its entirety. Appellants, however, dispute that Rousseau provides a suggestion to deposit a nitride of aluminum, hafnium or zirconium, in lieu of boron nitride, on the fibers during the method described in Borom. See the Brief, pages 5-7.

The dispositive question is, therefore, whether it would have been obvious to deposit the nitride of aluminum, zirconium, or hafnium, in lieu of boron nitride, on the fibers of the fiber reinforced composite described in Borom. We answer this question in the negative.

As indicated by appellants at page 3 of the Brief, Borom employs a boron nitride coating on the fibers to prevent or

substantially prevent reaction between the fibrous material and the infiltrating silicon. See column 3, lines 58-66. Rousseau, however, does not teach that the nitride of aluminum, zirconium or hafnium is equivalent to boron nitride for the purpose of preventing reaction between the fibrous material and the infiltrating silicon. See column 3, lines 5-15. In fact, we observe that Rousseau teaches away from using the nitrides involved in an environment where molten silicon (infiltrating silicon) is involved. See column 3, line 20. Absent the appellants' own teachings, we can think of no cogent reason why one of ordinary skill in this art would have been motivated to employ the nitride of aluminum, zirconium or hafnium, in lieu of boron nitride, on the fibers of the fiber reinforced composite described in Borom. As the court in ***Uniroyal, Inc. v. Rudkin-Wiley Corp.***, 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988) stated, "it is impermissible to use the claims as a frame and the prior art references as a mosaic to piece together a facsimile of the claimed invention."

In view of the foregoing, we reverse the examiner’s decision rejecting claims 10 through 16 under 35 U.S.C. § 103.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

SHERMAN D. WINTERS Administrative Patent Judge	)
ANDREW H. METZ Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
CHUNG K. PAK Administrative Patent Judge	)

jrg

Appeal No. 1995-4981
Application No. 08/248,583

General Electric Company
CRD Patent Docket Rm. 4A59
P.O. Box 8, Bldg. K-1-Salamone
Schenectady, NY 12301